In the Claims

The following Listing of Claims replaces all prior versions in the application:

LISTING OF CLAIMS

1. (Currently amended) A method comprising:

supplying current to an actuator configured to provide a haptic force to a haptic-feedback device;

calculating an average energy input to the~~an~~ actuator ~~coupled to a haptic-feedback device~~ over a predetermined period of time; and

reducing a maximum allowable current level in the actuator if the average energy input to the actuator exceeds a predetermined warning energy level.

2. (Previously presented) The method of claim 1, wherein the average energy input to the actuator is calculated by repeatedly moving an energy window by a predetermined timeslice and determining an intermediate average energy within the energy window after each of said movements.

3. (Previously presented) The method of claim 1, wherein the reducing the maximum allowable current level includes reducing the maximum allowable current level to a first current level if the average energy input to the actuator reaches the predetermined warning level, the first current level being associated with steady state operation.

4. (Previously presented) The method of claim 1, wherein the reducing the maximum allowable current level includes reducing the maximum allowable current level to a first level below a second current level if the average energy input to the actuator reaches the predetermined warning level, the second current level being associated with steady state operation.

5. (Previously presented) The method of claim 1, further comprising raising the maximum allowable current level in the actuator after the maximum allowable current level has been reduced if the average energy input to the actuator is below the predetermined warning energy level.

6. (Previously presented) The method of claim 1, wherein the reducing includes reducing the maximum allowable current level gradually as a ramp function.

7. (Previously presented) The method of claim 6, wherein the maximum allowable current level is reduced as a function of the energy by which the predetermined warning energy level has been exceeded.

8. (Previously presented) A method as recited in claim 1, further comprising:

determining a current in the actuator, the average energy input to the actuator being calculated based on the current in the actuator.

9. (Previously presented) The method of claim 1, wherein the calculating and the reducing are performed by a microprocessor local to the haptic feedback device.

10. (Previously presented) The method of claim 1, further comprising sensing current with a positive temperature coefficient (PTC) resettable fuse in a current path of the actuator, the fuse being configured to open so that a flow of the current is disrupted when the current increases to a fuse threshold level.

11. (Previously presented) The method of claim 1, wherein the actuator is a DC motor.

12. (Previously presented) An apparatus comprising:

a sensor configured to send a signal associated with a movement of a haptic-feedback device;

an actuator coupled to the haptic-feedback device and configured to output a haptic-feedback; and

a controller coupled to the actuator and configured to calculate an average energy input to the actuator over a predetermined period of time, the controller configured to reduce the maximum allowable current level in the actuator if average energy input to the actuator exceeds a predetermined warning energy level.

13. (Previously presented) The apparatus of claim 12, wherein the controller is configured to calculate the average energy input to the actuator by repeatedly moving an energy window by a predetermined timeslice and calculating an intermediate average energy input to the actuator within the energy window after each of said movements.

14. (Previously presented) The apparatus of claim 12, wherein the actuator is configured to reduce the maximum allowable current level to a first current level if the average energy input to the actuator reaches the predetermined warning level, the first current level being associated with steady state operation.

15. (Previously presented) The apparatus of claim 12, wherein the actuator is configured to reduce the maximum allowable current level to a first level below a second current level if the average energy input to the actuator reaches the predetermined warning level, the second current level being associated with steady state operation.

16. (Previously presented) The apparatus of claim 12, wherein the controller in configured to increase the maximum allowable current level in the actuator after the maximum allowable current level has been reduced if the average energy input to the actuator is below the predetermined warning energy level.

17. (Previously presented) The apparatus of claim 12, wherein the controller is a microprocessor local to the haptic feedback device.

18. (Previously presented) The apparatus of claim 12, further comprising a positive temperature coefficient (PTC) resettable fuse disposed in a current path of the actuator, the fuse being configured to open such that a flow of the current is disrupted when the current increases to a fuse threshold level.

19. (Previously presented) The apparatus of claim 12, wherein the at least one actuator is at least one DC motor.

20. (Currently amended) A method, comprising:

supplying current to an actuator of a haptic-feedback device such that the haptic-feedback device provides haptic feedback;

calculating an average energy input to an actuator over a predetermined period of time;

reducing a maximum allowable current level in the actuator if the average energy input to the actuator exceeds a predetermined warning energy level[[,]]; and

increasing the maximum allowable current level in the actuator if the average energy input to the actuator is below the predetermined warning energy level, the maximum allowable current level is not above a current level allowed by the actuator.

21. (Previously presented) The method of claim 20, wherein the average energy input to the actuator is calculated by repeatedly moving an energy window by a predetermined timeslice and determining an intermediate average energy input to the actuator within the energy window after each of the movements.

22. (Previously presented) The method of claim 20, wherein the actuator is configured to reduce the maximum allowable current level to a first current level if the average energy input to the actuator reaches the predetermined warning level, the first current level being associated with steady state operation.

23. (Previously presented) The method of claim 20, wherein the maximum allowable current level is increased gradually as a ramp function.

24. (Previously presented) The method of claim 20, wherein the maximum allowable current level is increased as a function of difference between the average energy input to the actuator and the predetermined warning energy level.